[0040] The "object side" optics **8** and each of the "image side" optics **71**, **72**, **73** may be or comprise one or more optical devices, such as one or more lenses.

[0041] FIG. **3** illustrates light **41** entering the apparatus via the aperture **4**. In this implementation, the object side optics **8** is configured to collimate light rays **41** emanating from an object, causing a parallel light beam to enter the color separation diffraction grating **10** for each point on the object. Each parallel light beam is incident upon the color separation diffraction grating **10** with a particular input/field angle.

[0042] The color separation diffraction grating **10** diffracts each parallel light beam, causing the different spectral components of light to be directed in different directions, as illustrated by the arrows **51**-**53** in FIG. **3**.

[0043] In this example, a first spectral component **52** of light directed to the zeroth order (which may, for example, be green light), is not diffracted further before being focused onto a first image sensor **32** by first image side optics **72**.

[0044] First and second blazed or slanted diffraction gratings **21**, **22** diffract the second and third spectral components **51**, **53** of light respectively (which may, for example, be red and blue light respectively), at least partially compensating for dispersion in the second and third spectral components **51**, **53**.

[0045] The diffraction gratings **21**, **22** reverse any changes in propagation direction that were introduced by the color separation diffraction grating **10**, as described above in relation to FIG. **1**. In this example, as in the FIG. **1** example, the diffraction gratings **21**, **22** change the propagation direction of the second and third spectral components **51**, **53** in the x-dimension such that, after the change has occurred, they propagate in the same direction as the collimated light incident upon the color separation diffraction grating **10**. This means that light emanating from a particular point on an object being imaged has the same input/field angle when it enters the image side optics **71**, **73** as it did when entering object side optics **8**, resulting in an accurate optical image being formed on each image sensor **31**-**33**.

[0046] Each image sensor **31**, **32**, **33** detects an image having the color of the dispersion compensated spectral component of light directed towards it. Each image sensor **31**, **32**, **33** may have a differently colored filter. However, since the color separation diffraction grating **10** separates light into different spectral components, there is no need for the image sensors **31**, **32**, **33** to have such color filters.

[0047] The images formed by the image sensors **31**, **32**, **33** may be combined to form a full color image.

[0048] FIG. **4** illustrates a second implementation **102** of the apparatus **100** illustrated in the functional schematic of FIG. **1**. The second implementation **102** differs from the first implementation **101** in that the "one or more further diffraction gratings **20**" consists of a second color separation diffraction grating **23** rather than first and second blazed/slanted gratings **21**, **22**.

[0049] In this implementation, the second color separation grating **23** may be the same as the first color separation grating **10** but orientated differently, such that it causes the opposite change in the propagation direction of the second and third spectral components **51**, **53** of light to that caused by the first color separation grating **10**.

[0050] The illustration of a particular order to the blocks in FIG. **2** does not necessarily imply that there is a required or preferred order for the blocks and the order and arrangement of the block may be varied. Furthermore, it may be possible for some blocks to be omitted.

[0051] Although embodiments of the present invention have been described in the preceding paragraphs with reference to various examples, it should be appreciated that modifications to the examples given can be made without departing from the scope of the invention as claimed.

[0052] For example, in some embodiments, the body **6** may be used as a light guide, inside which light is internally reflected. Each of the image sensors **31**-**33** may have the same resolution or different resolutions. Different settings may be applied to images captured by each of the image sensors **31**-**33**. The "image side" optics **71**, **72**, **73** may be controlled synchronously or separately.

[0053] In the examples described above, the second and third spectral components **51**, **53** of light are directed by the color separation diffraction grating **10** to negative and positive first orders. In other examples, however, one or both of the second and third spectral components **51**, **53** of light may be directed to higher orders. In such examples, the one or more further diffraction gratings **20** direct the second and third spectral components **51**, **53** of light to the opposite higher diffraction orders to the color separation diffraction grating **10**.

[0054] Features described in the preceding description may be used in combinations other than the combinations explicitly described.

[0055] Although functions have been described with reference to certain features, those functions may be performable by other features whether described or not.

[0056] Although features have been described with reference to certain embodiments, those features may also be present in other embodiments whether described or not.

[0057] Whilst endeavoring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

I/we claim:

1. An apparatus, comprising:

at least one color separation diffraction grating configured to direct different spectral components of incident light in different directions;

one or more further diffraction gratings configured to at least partially compensate for dispersion in one or more of the different spectral components of light; and

one or more image sensors configured to detect the one or more dispersion compensated spectral components of light.

2. An apparatus as claimed in claim **1**, wherein the at least one color separation diffraction grating is configured to change the propagation direction of at least one spectral component of light in at least a first dimension, and the one or more further diffraction gratings is configured to revert the at least one spectral component of light back to its propagation direction before the change.

3. An apparatus as claimed in claim **1**, wherein the at least one color separation diffraction grating is configured to diffract different spectral components of incident light to different diffraction orders.

4. An apparatus as claimed in claim **3**, wherein the at least one color separation diffraction grating is configured to dif-